

BREVICORYNELLA (HEMIPTERA: APHIDIDAE), A NEWLY RECORDED GENUS FROM CHINA, WITH THE DESCRIPTION OF A NEW SPECIES AND A NEW RECORD¹

Gexia Qiao², Liyun Jiang³, and Guangxue Zhang⁴

ABSTRACT: The aphid genus, *Brevicorynella* Nevsky, is newly recorded from China. A new species, *Brevicorynella sexmaculata* Qiao, Jiang, and Zhang, and a new record for China, *B. quadrimaculata* Nevsky, are described. *Tamarix* sp. (Tamaricaceae) is the host plant genus for both species.

KEY WORDS: Insecta, Aphididae, Macrosiphinae, *Brevicorynella*, new species, new record, *Tamarix*, China.

Nevsky (1929) erected *Brevicorynella* in the Aphidinae for *Brevicorynella quadrimaculata* collected from *Tamarix* sp. (Tamaricaceae) in Kazakhstan and Tadzhikistan in Central Asia. By careful examination, those specimens from Xinjiang Autonomous Region, China, include two species, such as type species and a new species, *Brevicorynella sexmaculata*. The host plants of *Brevicorynella*, *Tamarix* spp., are important sand binders in northwestern China. Biological studies on these aphids will have important effects on preventing deserts and binding sands.

Brevicorynella Nevsky was originally described in the Aphidinae because the distance between stigmal pori on 2nd and 3rd abdominal segments is less than twice as long as the distance between stigmal pori on 1st and 2nd abdominal segments. Also, its antennae are similar to in *Brachyunguis* (Blackman and Eastop, 1994). However, Remaudière and Remaudière (1997) placed *Brevicorynella* in the Macrosiphinae. The correct placement of *Brevicorynella* is still in question. Here, we follow Remaudière and Remaudière (1997) and think genus *Brevicorynella* is in Macrosiphinae, based on lacking lateral abdominal tubercles. These have the same shape of siphunculi as *Brevicoryne* van der Goot (in the Macrosiphinae).

METHODS

The specimens were collected from inflorescences, leaves, and stems of *Tamarix* located in the Xinjiang Autonomous Region of the People's Republic of China (Baicheng County, 1280m; Jinghe County, 300m; Minfeng County,

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² Institute of Zoology, Chinese Academy of Sciences, 25 Beisihuanxi Road, Haidian, Beijing 100080, P.R. China. E-mail: qiaogx@panda.ioz.ac.cn.

³ Institute of Zoology, Chinese Academy of Sciences, Beijing 100080 P. R. China. E-mail: jiangliyun2000@hotmail.com

⁴ Institute of Zoology, Chinese Academy of Sciences, Beijing 100080 P. R. China. E-mail: zhanggx@panda.ioz.ac.cn

1300m; Shihezi City, 450m) by Liyun Jiang. All specimens are deposited in the Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, Beijing, China. Nomenclature and descriptions follow Nevsky (1929). All measurements are given in millimeters (mm).

***Brevicorynella* Nevsky, 1929 NEW RECORD FOR CHINA**

Brevicorynella Nevsky, 1929, Bull. Pl. Prot. Stn., Taskent, 16:257.

Brevicorynella Nevsky: Blackman and Eastop, 1994:587; Rемаудиере and Rемаудиере, 1997:82.

Type Species. *Brevicorynella quadrimaculata* Nevsky, 1929, by original designation.

Diagnosis. Body elliptical, posterior of abdomen tapered. Frons convex; frontal tubercles indistinct. Eyes protuberant, lacking ocular tubercles. Antennae 6-segmented, shorter than body; antennal segment III with 1 or 2 small round secondary rhinaria medially; processus terminalis 1/4-1/3 base of the segment. Mesosternal furca with separated two arms. All first tarsal segments bearing 5 setae. Spiracular plates well-developed, long finger-shaped in thorax, or lower cone in abdomen; spiracles small rounded, posteriorly. Pronotum with 2 pairs of short cylindrical spinal tubercles and 1 pair of cone marginal tubercles. Abdomen without marginal tubercles, dorsum of abdomen with 4 to 6 large dorsal patches. Siphunculi short, slightly swollen, constricted at basally, and with apical flange; on 5th abdominal segment. Cauda tongue-shaped, slightly constricted at medially.

Host plants. *Tamarix* spp. (Tamaricaceae)

Distribution. In Central Asia (China, Kazakhstan and Tadzhikistan).

The genus is represented by two species: *Brevicorynella quadrimaculata* Nevsky and *Brevicorynella sexmaculata* Qiao and Zhang new species. This is the first record of *Brevicorynella* for China.

KEY TO SPECIES APTEROUS VIVIPAROUS FEMALE *BREVICORYNELLA* FROM CHINA

Vertex without distinct sculptures; dorsum of abdomen with 2 pairs of large spino-pleural patches; siphunculi distinctly shorter than cauda; cauda with 30-39 hairs
.....*Brevicorynella quadrimaculata* Nevsky

Vertex with distinct sculptures; dorsum of abdomen with 3 pairs of large spino-pleural patches; siphunculi about as long as or slightly longer than cauda; cauda with 48-59 hairs.....
.....*Brevicorynella sexmaculata* n. sp.

***Brevicorynella quadrimaculata* Nevsky, 1929 NEW DISTRIBUTION (Figs. 1-7, 18-28)**

Brevicorynella quadrimaculata Nevsky, 1929:257-259.

Brevicorynella quadrimaculata Nevsky: Blackman and Eastop, 1994:587; Rемаудиере and Rемаудиере, 1997:82.

Diagnosis: This species is close to *Brevicorynella sexmaculata* Qiao, Jiang, and Zhang, but differs from the latter (parenthesized) as follows: vertex without distinct sculptures (vertex with distinct sculptures); dorsum of abdomen with 2 pairs of large spino-pleural patches (dorsum of abdomen with 3 pairs of large spino-pleural patches); siphunculi distinctly shorter than cauda (siphunculi about as long as or slightly longer than cauda); cauda with 30-39 hairs (cauda with 48-59 hairs).

Description of apterous viviparous females. Body (Fig. 18) small, oval, dark green in life with 2 pairs of black patches on dorsum of abdomen (Fig. 19), and covered with a fine pruinose secretion, 1.200-1.300mm long, 0.725-0.825mm wide at thorax. In mounted specimens: dorsal of head, apex of rostrum, 1st antennal segment, distal of 3rd antennal segment, tip of 4th and 5th segments, distal half of basal of 6th segment, distal 1/3 of tibia and tarsi darkly brown; eyes, femora, cauda, anal plate, and genital plate brown; 2nd antennal segment, processus terminalis, and siphunculi pale brown; others pale.

Vertex arc-shaped, antennal tubercles weak (Figs. 1, 20). Dorsal hairs of body fine and pointed. Head with 2 pairs of cephalic hairs, 4 or 5 dorsal hairs between two antennae, and 2-3 pairs of dorsal hairs between eyes (Fig. 1). Length of cephalic hairs 0.021-0.031 mm, 0.8x-1.2x as long as widest diameter of 3rd antennal segment. Antennae 6-segmented (Figs. 2, 21), shorter, 0.613-0.721 mm long, 0.49x-0.58x as long as body; 3rd-6th segments with weak imbrications. Proportion of 1st-6th segments: 52: 38: 100: 96: 95: 85+32; processus terminalis 0.36x-0.41x as long as basal part. Antennal hairs short and pointed, 1st-6th segments each with 4 or 5, 2 or 3, 2-5, 3 or 4, 2-7, 3+0 hairs, respectively; apex of processus terminalis with 3 hairs; length of hairs on 3rd antennal segment 0.018 mm, 0.69x as long as widest diameter of this segment. Middle of 3rd antennal segment with one small round secondary rhinarium. Rostrum reaching 2nd to 3rd abdominal segments; ultimate rostral segment wedge-shaped (Figs. 3, 22), 2x-2.22x as long as its basal diameter, 0.68x as long as 2nd segment of hind tarsi, with 2 accessory hairs. Thorax tergum membranous. Pronotum with 2-4 spinal, 1 pair of pleural and 1 pair of marginal hairs; with 2 pairs of short cylindrical spinal tubercles and 1 pair of cone marginal tubercles. Hind femur 0.330-0.361 mm long, 2.35x-2.65x as long as 3rd antennal segment. Hind tibia 0.515-0.577 mm long, 0.38x-0.41x as long as body. Hairs on legs short and pointed; length of hairs on hind tibia 0.036-0.046 mm, 1.18x-1.5x as long as middle diameter of the segment. First tarsal chaetotaxy: 5, 5, 5. Mesosternal furca with two arms separated. Abdomen tergum membranous, with 2 pairs of large brown spino-pleural patches on 2nd and 5th abdominal tergites (Fig. 4); dorsal hairs on abdominal tergites short and pointed; 1st abdominal tergite with 9-12 hairs; 8th tergite with 8 hairs, 6 or 7, occasionally. Length of marginal hairs on 1st tergite 0.021-0.031 mm, which of dorsal hairs on 8th tergite 0.026-0.042 mm, 0.8x-1.2x and 1x-1.6x as long as widest diameter of 3rd antennal segment, respectively. Spiracles (Figs. 23, 27) small, round and posteriorly directed, spiracular plates well-developed, long finger-shaped thoracically, or lower cone in abdominally, brown. Siphunculi short, slightly swollen, constricted at base, with flange (Figs. 5, 28), with weakly imbrications; 0.093-0.124 mm in length, distal diameter 0.04 mm, length 2.25x-2.5x as long as its basal width, 0.75x-0.91x as long as cauda. Cauda tongue-shaped, slightly constricted medially (Figs. 6, 24), with weakly spinulose short imbrications, 0.113-0.134 mm long, 0.92x-1.08x as long as its basal diameter, with 30-39 hairs. Anal plate (Fig. 25) circular at apex with weakly spinulose short imbrications and 40-54 hairs. Genital plate (Figs. 7, 26) with 13-17 hairs, 2 anterior hairs among them.

Alate and oviparae: Not seen.

Examined Specimens. 7 apterous viviparous females, deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, P. R. China, data: CHINA, XINJIANG AUTONOMOUS REGION, JINGHE Co.: 82.9°E, 44.6°N, 300 m, 30 Aug. 2002, on *Tamarix chinensis*, by Liyun Jiang (No. 13742); 3 apterous viviparous females, deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, P.R.China, data: CHINA, XINJIANG AUTONOMOUS REGION, SHIHEZI CITY: 86.0°E, 44.2°N, 300 m, 17 Aug. 2002, on *Tamarix chinensis*, by Liyun Jiang (No. 13659); 7 apterous viviparous females, deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, P. R.China, data: CHINA, XINJIANG AUTONOMOUS REGION, MINFENG Co.: 82.6°E, 37.0°N, 300 m, 27 Sep. 2002, on *Tamarix chinensis*, by Liyun Jiang (No. 14012).

Distribution. Central Asia: China: Xinjiang (Jinghe, Shihezi, Minfeng); Kazakhstan, Tadjikistan.

Biology. The aphids cluster on floscules, leaves, and stems of *Tamarix chinensis* or *Tamarix* sp., and are attended by ants.

Brevicorynella sexmaculata Qiao and Zhang, NEW SPECIES

(Figs. 8-17, 29-39)

Diagnosis. The new species is near to *Brevicorynella quadrimaculata* Nevsky, but differs from it as follow: vertex with distinct sculptures (the latter: vertex without distinct sculptures); dorsum of abdomen with 3 pairs of large spino-pleural patches (the latter: dorsum of abdomen with 2 pairs of large spino-pleural patches); siphunculi about as long as or slightly longer than cauda (the latter: siphunculi distinctly shorter than cauda); cauda with 48-59 hairs (the latter: cauda with 30-39 hairs).

Description of apterous viviparous females. Body (Fig. 29) medium, oval, green in life with 3 pairs of black patches on dorsum of abdomen (Fig. 30), and covered with a fine pruinose secretion, 1.250-1.625mm long, 0.875-1.200mm wide. In mounted specimens: dorsal of head, apex of rostrum, distal of 3rd and 4th antennal segments, distal 1/3 of 5th segment, distal half of basal of 6th segment, processus terminalis, outer distal half of femora, basal and distal 1/3 of tibia, tarsi, cauda, and anal plate darkly brown; 1st antennal segment brown; 2nd antennal segment pale brown; others pale.

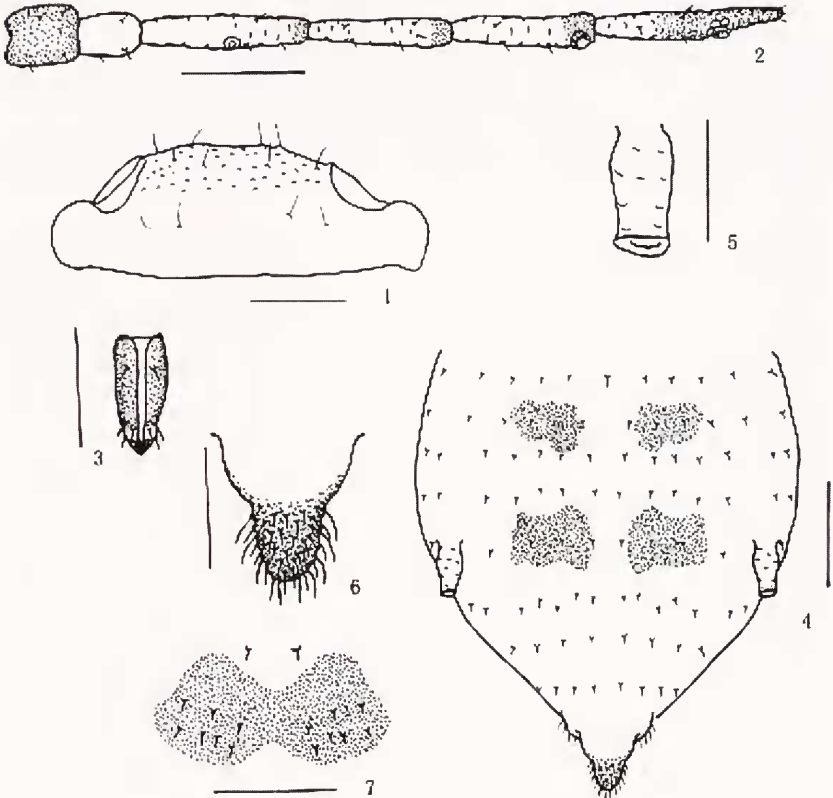
Vertex arc-shaped, antennal tubercles weak (Figs. 8, 31). Dorsal of head with distinct sculptures. Dorsal hairs of body fine, acute. Head with 2 pairs of cephalic hairs, 5-7 dorsal hairs between two antennae, and 2 pairs of dorsal hairs between eyes (Fig. 8). Length of cephalic hairs 0.031-0.036 mm, 1.17x-1.4x as long as widest diameter of 3rd antennal segment. Antennae 6-segmented (Figs. 9, 32), shorter, 0.793-0.892mm long, 0.53x-0.6x as long as body; 3rd-6th segments with weak imbrications. Proportion of 1st-6th segments: 33: 33: 100: 88: 88: 74+24; processus terminalis 0.29x-0.38x as long as basal part. Antennal hairs short, acute, 1st-6th segments each with 4 or 5, 3, 3-6, 3-6, 3 or 4, 2-4+0 hairs, respectively; apex of processus terminalis with 3 hairs; length of hairs on 3rd antennal segment 0.015-0.021 mm, 0.5x-0.8x as long as widest diameter of this segment. One small rounded secondary spinularium on middle of 3rd antennal segment. Rostrum reaching 1st to 3rd abdominal segments; ultimate rostral segment wedge-shaped (Figs. 10, 33), 2x-2.22x as long as its basal diameter, 0.68x as long as 2nd segment of hind tarsi, with 2 accessory hairs. Thorax tergum membranous. Pronotum with 2 pairs of spinal, 1 pair of pleural and 1 pair of marginal hairs; with 2 pairs of short cylindrical spinal tubercles and 1 pair of cone marginal tubercles (Figs. 11, 31). Hind femur 0.391-0.422 mm long, 2.05x-2.17x as long as 3rd antennal segment. Hind tibia 0.639-0.721 mm long, 0.43x-0.49x as long as body. Hairs on legs short and pointed; length of hairs on hind tibia 0.046-0.052 mm, 1.32x-1.67x as long as middle diameter of the segment. First tarsal chaetotaxy: 5, 5, 5. Mesosternal furca with two arms separated. Abdomen tergum membranous, with 3 pairs of large brown spino-pleural patches on 2nd - 5th abdominal tergites (Figs. 14, 30); dorsal hairs on abdominal tergites short and pointed; 1st abdominal tergite with 7-11 hairs; 8th tergite with 6 hairs, or 7, occasionally. Length of marginal hairs on 1st tergite 0.31 mm, which of dorsal hairs on 8th tergite 0.031-0.052 mm, 1x-1.2x and 1x-2x as long as widest diameter of 3rd antennal segment, respectively. Spiracles small, round and posterior-ward, spiracular plates very developed, brown; long finger-shaped in thorax (Figs. 12, 34), or lower cone in abdomen (Figs. 13, 38). Siphunculi short, slightly swollen, constricted at base, with flange (Figs. 15, 39), with weakly imbrications; 0.144-0.165 mm in length, distal diameter 0.045 mm, length 2.33x-4x as long as its basal width, 0.93x-1.07x as long as cauda. Cauda tongue-shaped, non-constricted medially (Figs. 16, 35), with weakly spinulose short imbrications, 0.144-0.165 mm in length, 1.08x-1.33x as long as its basal diameter, with 48-59 hairs. Anal plate (Figs. 17, 36) circular at apex with weakly spinulose short imbrications and 51-68 hairs. Genital plate (Figs. 18, 37) with 18-21 hairs, 2 anterior hairs among them.

Alate and oviparae: Not seen.

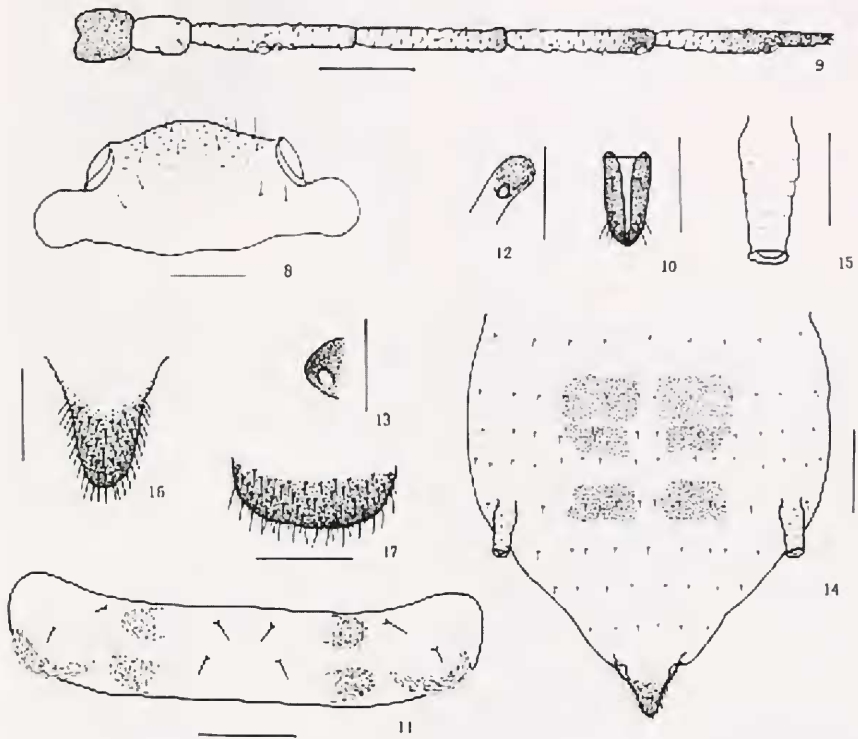
Types. Holotype, apterous viviparous female (Figs. 8-17), deposited in Zoological Museum, Institute of Zoology, Chinese Academy of Sciences, P.R. China, data: CHINA, XINJIANG AUTONOMOUS REGION, BAICHENG Co.: 81.8°E, 41.8°N, 1280 m, 12 Sep. 2002, on *Tamarix*

chinensis, by Liyun Jiang (No.13864); paratypes: 19 apterous viviparous females, other data same as holotype.

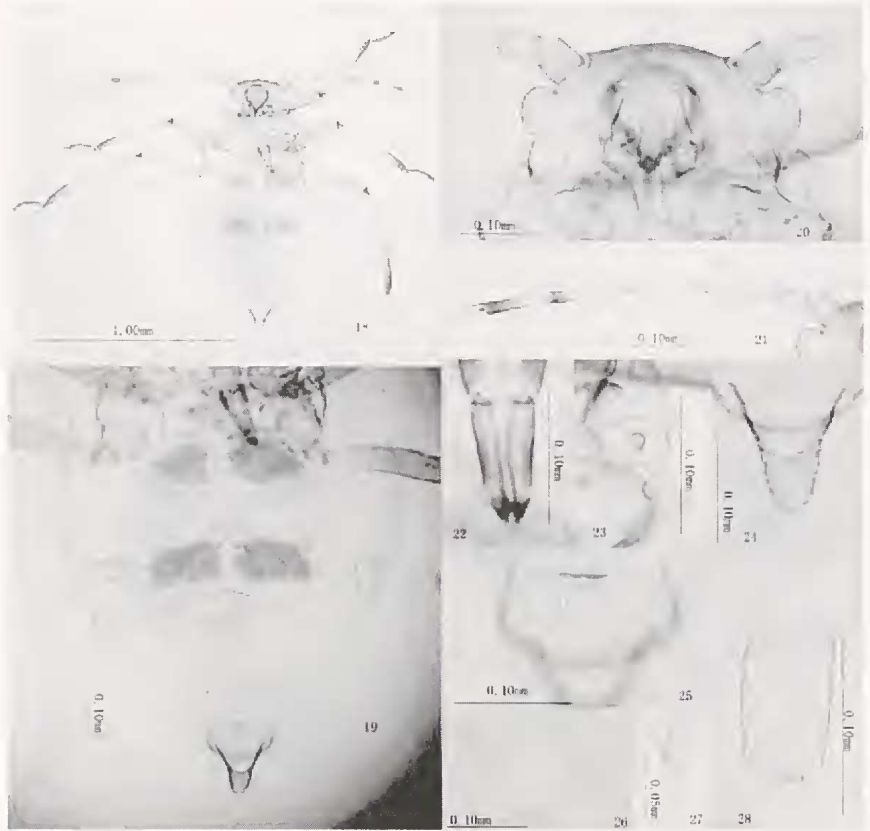
Etymology. The new species is named for the 6 large dorsal patches on dorsum of abdomen.



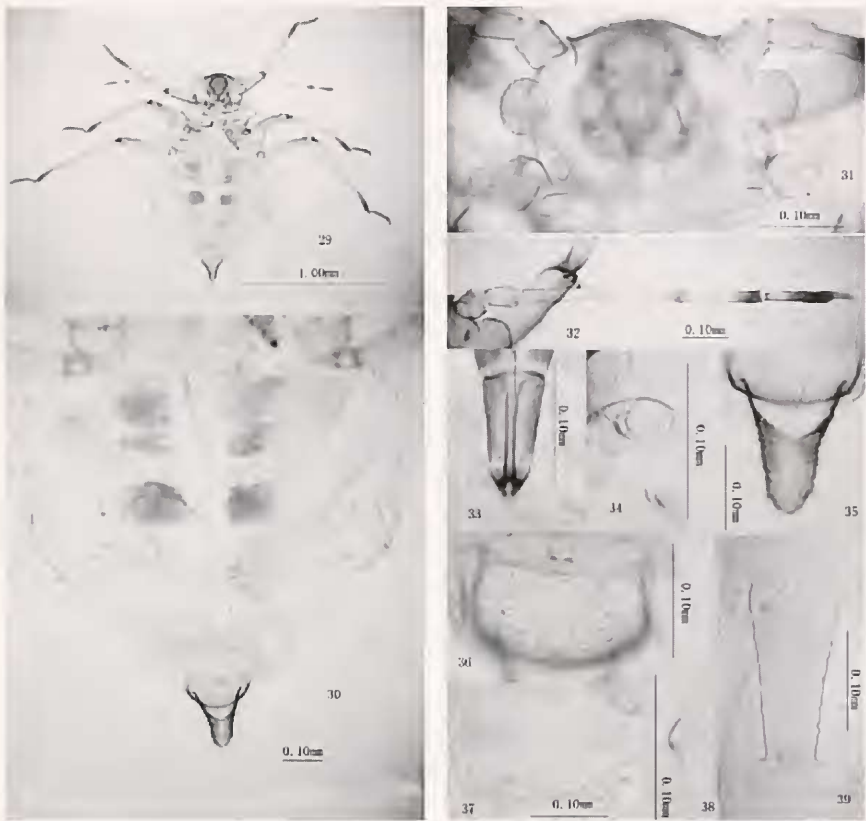
Figures 1-7 Apterous viviparous females of *Brevicoryella quadrimaculata*. Figure 1 Dorsal view of head. Figure 2 Antenna. Figure 3 Ultimate rostral segment. Figure 4 Dorsal view of abdomen. Figure 5 Siphunculus. Figure 6 Cauda. Figure 7 Genital plate. Scale bar: Figs. 1-3, 5-6 = 0.1 mm; Fig. 4 = 0.2 mm.



Figures 8-17 Apterous viviparous females of *Brevicorynella sexmaculata*. Figure 8 Dorsal view of head. Figure 9 Antenna. Figure 10 Ultimate rostral segment. Figure 11 Dorsal tubercles on pronotum. Figure 12 Spiracle and spiracular plate on metathorax. Figure 13 Spiracle and spiracular plate on abdominal segment. Figure 14 Dorsal view of abdomen. Figure 15 Siphunculus. Figure 16 Cauda. Figure 17 Anal plate. Scale bar: Figs. 8-12, 15-17 = 0.1 mm; Figs. 13, 14 = 0.2 mm.



Figures 18-28 Apterous viviparous females of *Brevicoryella quadrimaculata*. Figure 18 Dorsal view of body. Figure 19 Dorsal view of abdomen. Figure 20 Dorsal view of head and pronotum, showing tubercles on pronotum. Figure 21 Antenna. Figure 22 Ultimate rostral segment. Figure 23 Spiracle and spiracular plate on metathorax. Figure 24 Cauda. Figure 25 Anal plate. Figure 26 Genital plate. Figure 27 Spiracle and spiracular plate on abdominal segment. Figure 28 Siphunculus.



Figures 29-39 Apterous viviparous females of *Brevicoryella sexmaculata*. Figure 29 Dorsal view of body. Figure 30. Dorsal view of abdomen. Figure 31 Dorsal view of head and pronotum, showing tubercles on pronotum. Figure 32 Antenna. Figure 33 Ultimate rostral segment. Figure 34 Spiracle and spiracular plate on metathorax. Figure 35 Cauda. Figure 36 Anal plate. Figure 37 Genital plate. Figure 38 Spiracle and spiracular plate on abdominal segment. Figure 39 Siphunculus.

Table. 1 Measurements of apterous viviparous females of *Brevicorynella quadrimaculata* (mm).

No.	Body length	Body width	Hind femur	Hind tibia	2nd hind tarsus	URS length	Ant. III	Ant. IV	Ant. V	Base of ant. VI	Processus terminalis	Siphunculi length	Cauda length
1	1.200	0.800	0.361	0.577	0.155	0.103	0.144	0.144	0.139	0.124	0.046	0.103	0.134
2	1.225	0.750	0.330	0.525	0.144	0.103	0.144	0.124	0.124	0.113	0.046	0.103	0.124
3	1.300	0.825	0.340	0.525	0.144	0.103	0.129	0.103	0.118	0.113	0.042	0.103	0.134
4	1.275	0.825	0.340	0.556	0.144	0.103	0.144	0.155	0.139	0.124	0.046	0.103	0.124
5	1.250	0.825	0.330	0.515	0.134	0.093	0.124	0.118	0.113	0.103	0.042	0.093	0.124
6	1.200	0.725	0.330	0.536	0.155	0.093	0.124	0.129	0.134	0.113	0.042	0.124	0.124
7	1.250	0.775	0.350	0.567	0.144	0.103	0.149	0.144	0.144	0.118	0.046	0.103	0.113
Average±	1.243±	0.789±	0.340±	0.543±	0.146±	0.100±	0.137±	0.131±	0.130±	0.115±	0.044±	0.105±	0.125±
1 sd	0.029	0.036	0.008	0.019	0.019	0.004	0.010	0.014	0.011	0.006	0.002	0.009	0.006

Table 2. Measurements of apterous viviparous females of *Brevicoryella sexmaculata* (mm).

No.	Body length	Body width	Hind femur	Hind tibia	2nd hind tarsus	URS length	Ant. III	Ant. IV	Ant. V	Base of ant. VI	Processus terminalis	Siphunculi length	Cauda length
1	1.600	0.975	0.422	0.700	0.155	0.103	0.196	0.175	0.165	0.144	0.042	0.165	0.154
2	1.550	0.900	0.391	0.69	0.155	0.103	0.185	0.165	0.155	0.134	0.052	0.144	0.144
3	1.250	0.775	0.402	0.680	0.165	0.103	0.196	0.165	0.175	0.144	0.042	0.144	0.155
4	1.525	0.975	0.412	0.680	0.155	0.103	0.175	0.160	0.160	0.139	0.046	0.155	0.144
5	1.475	0.875	0.391	0.680	0.165	0.103	0.185	0.155	0.155	0.144	0.046	0.155	0.155
6	1.375	0.900	0.422	0.711	0.165	0.103	0.185	0.175	0.180	0.134	0.046	0.165	0.155
7	1.500	0.900	0.402	0.721	0.165	0.103	0.196	0.185	0.175	0.144	0.042	0.165	0.160
8	1.525	1.200	0.422	0.721	0.165	0.103	0.206	0.175	0.155	0.139	0.042	0.165	0.165
9	1.625	1.025	0.391	0.639	0.155	0.093	0.180	0.144	0.165	0.134	0.046	0.155	0.144
10	1.400	1.000	0.422	0.721	0.165	0.093	0.196	0.185	0.185	0.149	0.052	0.165	0.165
Average±	1.483±	0.963±	0.408±	0.694±	0.161±	0.101±	0.190±	0.168±	0.167±	0.141±	0.046±	0.158±	0.155±
1 sd	0.091	0.104	0.012	0.028	0.004	0.004	0.009	0.014	0.011	0.005	0.003	0.006	0.008

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